**DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 13.28

# WELDING INSPECTION REPORT

**Resident Engineer:** Pursell, Gary
**Address:** 333 Burma Road
**City:** Oakland, CA 94607

**Report No:** WIR-012859
**Date Inspected:** 31-Mar-2010

**Project Name:** SAS Superstructure
**Prime Contractor:** American Bridge/Fluor Enterprises, a JV
**Contractor:** Oregon Iron Works Clackamas, Or.

**OSM Arrival Time:** 1000
**OSM Departure Time:** 1830
**Location:** Clackamas, OR

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|---|---|---|---|---|---|---|---|---|
| **CWI Name:** | M. Gregson, J. Salazar | | | **CWI Present:** | ☑ Yes | ☐ No | | |
| **Inspected CWI report:** | ☐ Yes | ☑ No | ☐ N/A | **Rod Oven in Use:** | ☐ Yes | ☐ No | ☑ N/A | |
| **Electrode to specification:** | ☑ Yes | ☐ No | ☐ N/A | **Weld Procedures Followed:** | ☑ Yes | ☐ No | ☐ N/A | |
| **Qualified Welders:** | ☑ Yes | ☐ No | ☐ N/A | **Verified Joint Fit-up:** | ☑ Yes | ☐ No | ☐ N/A | |
| **Approved Drawings:** | ☑ Yes | ☐ No | ☐ N/A | **Approved WPS:** | ☑ Yes | ☐ No | ☐ N/A | |
| | | | | **Delayed / Cancelled:** | ☐ Yes | ☑ No | ☐ N/A | |

**Bridge No:** 34-0006
**Component:** Hinge K Pipe Beams

**Summary of Items Observed:**

The Quality Assurance Inspector Sean Vance arrived on site at Oregon Iron Works, Inc (OIW) in Clackamas, OR, to randomly observe the in process welding of the Hinge K Pipe Beam assemblies. The QA Inspector arrived on site to randomly observe the OIW Quality Control (QC) Inspectors in process and completed visual and nondestructive testing. Upon the arrival of the QA Inspector the following observations were made:

Hinge-K Pipe Beam Assembly 101A-1:
The QA Inspector witnessed WID #B62 perform grinding activities, utilizing a mechanical grinder, on the inside of this assembly 101A-1. The QA Inspector spoke with Lead QC Inspector Mike Gregson and he explained that WID #B62 was currently grinding on the weld joint #WM4-1, Fuse 120A-1 to Forging 102A-1, which was previously marked by QC Inspector Jose' Salazar, for excessive reinforcement. The QA Inspector noted that per AWS D1.5, up to 3mm reinforcement is acceptable.

Hinge-K Pipe Beam Assembly 102A-2:
The QA Inspector witnessed WID #B62 (Marcus Belgarde), performing the submerged arc welding (SAW) on the a110 Base plate to b106 HPS 485W stiffener. The QA Inspector noted that this weld joint was designated as a partial joint penetration (AWS D1.5 TC-P4-S), weld joint (WJ) #W2-17 and WID #B62 was performing the SAW in the flat (1G) position. The QA Inspector noted that the SAW fill passes were currently in-process and noted that the OIW approved welding procedure specification (WPS 4020), was being utilized. The QA Inspector noted that QC Inspector Jose´ Salazar, was present and QC Inspector Salazar explained that the in-process welding parameters/pre-heat temperatures, were intermittently verified. QC Inspector Salazar explained that the average welding parameters for the SAW fill passes, currently in process, were recorded at 580 amps/32.5 volts, with a

pre-heat of approximately 350 degrees Fahrenheit (177 C) and travel speed of 20 inches per minute (i.p.m). The QA Inspector randomly verified pre-heat of approximately 350 degrees Fahrenheit (177 C) and welding parameters to be in compliance with the applicable WPS 4020. The QA Inspector noted that the SAW appeared to be in compliance with AWS D1.5 and the applicable WPS.

Hinge-K Pipe Beam Assembly 102A-3:
The QA Inspector witness an OIW Machinist continuing to machine the completed HPS 485W, mill-to-bear stiffeners.

Hinge-K Pipe Beam Assembly 120A-8:
The QA Inspector witnessed WID #F17 perform grinding activities, utilizing a mechanical grinder, on the completed Stainless Steel overlay. WID #F17 explained that he was in-process of grinding high spots and various visual discrepancies that were previously marked by OIW QC Inspector Jose' Salazar. The QA Inspector spoke with QC Inspector Salazar and he explained that the grinding should be complete on this shift and OIW production personell will probably then remove this fuse 120A-8 from Bay 8 and transfer to the storage yard area. The QA Inspector noted that this Fuse will eventually be transferred to AG Machine Works, for the final machining of the overlay. QC Inspector Salazar then explained that OIW production personell will then transfer the Fuse 120A-2, from the storage yard area to Bay 8 and place on the rollers, in preparation for an additional layer of 316L stainless steel overlay. The QA Inspector noted that this Fuse had previously been at AG Machine Works and multiple weld repairs were discovered during the final machining. At the time, OIW Project Manager Bill Pender instructed AG to machine pass the required tolerance, to possibly remove most of the weld repairs. The QA Inspector noted that additional areas of repairs were still needed at this time. QC Inspector Salazar explained that the repairs will be completed, prior to the layer of 316L. The QA Inspector was then informed by QC Inspector Salazar that due to the Fuse being previously cut to length at AG machine Works, the Fuse will fit on the automatic rollers. QC Inspector Salazar explained that material will be tack welded on the end of the Fuse,that was previously cut off another Fuse, to accommodate the fit on the rollers. The QA Inspector noted that during the Electroslag Welding Process (ESW), the rollers are set to rotate to maintain the welding travel speed. QC Inspector Salazar explained that once the ESW is complete, the tacks will be cut, the ring will then be removed and the areas that were tack welded on the end of the Fuse, will be smoothed flush. QC Inspector Salazar explained that Magnetic Particle testing (MT) and a hardness check will be performed on the areas.
The QA Inspector later witnessed WID #H49 (Rick Hinckle) utilizing a hand held oxygen acetylyne torch to cut bevels on the ring, in preparation for the fit-up and FCAW tack welding of this ring to the end of the Fuse. See attached picture below.

Material, Equipment, and Labor Tracking (MELT)
QA Inspector Sean Vance performed a verification of material, personnel and equipment involved with the project. The QA Inspector observed at Oregon Iron Works: 4 OIW production personnel and 2 QC Inspectors on day shift-2 OIW production and 1 QC on swing shift.
The QA Inspector noted that the following personell were present at AG Machine shop:1 Machinist and 1 Machinist supervisor.

# WELDING INSPECTION REPORT

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**Summary of Conversations:**

As noted above.

**Comments**

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mohammad Fatemi (916) 813-3677, who represents the Office of Structural Materials for your project.

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| **Inspected By:** | Vance,Sean | Quality Assurance Inspector |
| **Reviewed By:** | Adame,Joe | QA Reviewer |